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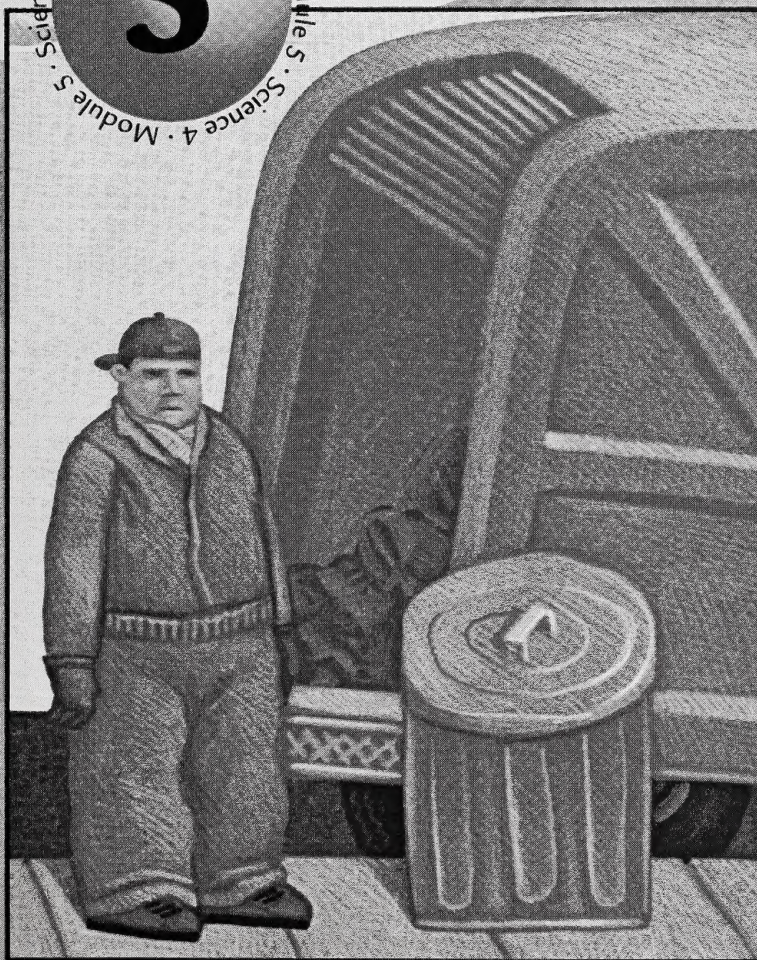


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# Science 4

Waste and Our World  
Home Instructor's Guide and  
Assignment Booklet 5A

Science 4 • Module 5 • Science 4 • Module 5  
**5**  
Science 4 • Module 5 • Science 4 • Module 5



**Alberta**  
EDUCATION



Learning  
Technologies  
Branch



Science 4  
Module 5: Waste and Our World  
Home Instructor's Guide and Assignment Booklet 5A  
Learning Technologies Branch  
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**The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Home Instructor's Guide and Assignment Booklet.**

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	



You may find the following Internet sites useful:

- Alberta Education, <http://www.education.gov.ab.ca>
- Learning Technologies Branch, <http://www.education.gov.ab.ca/ltb>
- Learning Resources Centre, <http://www.lrc.education.gov.ab.ca>

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# Module 5: Waste and Our World

## Overview

This module introduces your student to wastes produced through natural processes and human activity. Your student will begin by studying how plants, animals, and other living things are made up of materials that are recycled through the environment. He or she will investigate wastes and human-produced pollution. Your student will discover how wastes are generated and some of the options for waste disposal.

With each lesson, there are hands-on activities to help your student understand the concepts presented. A number of activities take several days before results are seen (for example, mini-composters). You may want to read through the activities and make a note to remind your student to return to activities when necessary. There are extra hands-on activities in the Optional Follow-up Activities at the end of each section.

There are several links to Internet sites throughout this module. You may want to have a look at these sites with your student. As well, ideas are provided for more activities if your student is particularly keen. These sites also have good links to other websites and background information that may help if your student requires more information.

- Science Alberta Foundation  
<http://www.sciencealberta.org>
- Environment Canada  
<http://www.ec.gc.ca/envhome.html>
- Alberta Environment  
<http://environment.gov.ab.ca/>

There are also many excellent print resources available. You may find *Looking at the Environment* by David Suzuki (Toronto: Stoddard, 1989) and *Keepers of the Earth* by Michael Caduto and Joseph Bruchac (Saskatoon: Fifth House, 1994) good places to start.

## Notes to the Home Instructor

This booklet contains the following components for you and your student:

### 1. Home Instructor's Guide

These are notes for you. First, there is an overview, a listing of suggested websites, and a listing of additional required materials needed for the section. Then, there is an overview of the content, activities, learning outcomes, and special requirements of each lesson in the section.

**Note:** To ensure that you have all of the materials on hand for your student to complete the activities for each module, read through the list of materials required for the lessons. They are boxed for easy reference, as shown in the following example.

## Activity 1: Decomposing Dinner

- 2 slices of tomato
- 2 pieces of lettuce
- 2 slices of carrot (about 1 cm thick)
- 2 plant pots
- a tray (pie plate or baking pan)
- garden soil (not potting soil)
- a spoon
- water

## 2. Assignment Record Form

This is a form to send in with the assignments. Remember to paste the address label provided by your school on it. The teacher will keep track of your student's assignments, record your student's grades, and include his or her comments using this form.

## 3. Assignment

Your student should answer all questions in complete sentences where possible. Questions set up as lists, tables, charts, or graphs do not need sentence answers. Send the assignment to the teacher as soon as the booklet has been completed.

## 4. Home Instructor Feedback Form and Student Feedback Form

You and your student should complete these forms. Send them in at the same time as the assignment. They provide us with helpful information about what we are doing right and what needs to be changed.

## 5. Checklist

The checklist helps you confirm that all of the required components have been collected prior to submitting the completed work to the teacher. For students completing this module electronically, this checklist also includes spaces to indicate the method of submitting graphs, drawings, or photos of assignment work where required.

# Section 1: Natural and Human-Made Waste

## Overview

This section gives your student a chance to look at waste and where it comes from. Your student should see that waste comes both from humans and from nature. He or she will see that nature has developed ways to cope with the waste that comes directly from the environment. Your student will see that humans create waste that often isn't so easily handled. In particular, he or she will look at air, water, and land pollution caused by humans. This is in preparation for the second section of the module.

## Assessment and Feedback

The feedback you and your student provide in the feedback forms will assist the teacher in assessing your student's progress.

The Section 1 Assignment is worth 35 marks out of a total 112 marks for this module.



## Websites Mentioned in Module 5: Section 1

It is recommended that you check these websites prior to your student beginning work on this section.

### Lesson 2

- YES! Youth for Environmental Sanity  
<http://www.yesworld.org/resources.html>
- Paris Sewers Museum
  - [http://www.mtholyoke.edu/courses/rschwartz/hist255-s01/mapping-paris/Paris\\_Sewers\\_Page.html](http://www.mtholyoke.edu/courses/rschwartz/hist255-s01/mapping-paris/Paris_Sewers_Page.html)
  - <http://europeforvisitors.com/paris/articles/paris-sewers-museum.htm>

## Additional Required Materials

### Activity 1: Decomposing Dinner

- 2 slices of tomato
- 2 pieces of lettuce
- 2 slices of carrot (about 1 cm thick)
- 2 plant pots
- a tray (pie plate or baking pan)
- garden soil (not potting soil)
- a spoon
- water

### Activity 2: Air Fare

- 4 similar jars
- 4 coffee filters
- a funnel
- a magnifying glass (optional)
- water
- masking tape
- a felt marker

### Activity 3: Bath or Shower?

- a bathtub with a shower
- a ruler

## Activity 4: Biodegradable Bits

- a clear plastic cup or other clear, wide-mouthed container
- garden soil (not potting soil)
- waste scraps: small pieces of paper, cardboard, aluminum foil, plastic, and a few vegetable or fruit scraps
- plastic wrap

## Optional Follow-up Activities

### Activity 1: Pollution in the News

- newspapers
- pencil crayons or markers

## Lesson Summaries

### Lesson 1: Plant and Animal Wastes

#### Summary

In this lesson, your student will discover that all plants, animals, and other living things produce wastes that are recycled through the environment. For example, leaves die and decay; feces decompose; gases produced by plants (oxygen) are used and recycled by animals. Your student will see how natural decomposers help recycle plant and animal waste. He or she will experiment with decomposition in Activity 1. This activity is easy to set up, but it takes several days before your student will see the results. Remind your student to return to the activity later in the week to look for decomposing matter. Ensure that he or she uses garden soil and not potting soil; potting soil will not have the bacteria necessary for good decomposition. The feature “A Closer Look” discusses the problem of run-off from cities, farms, and other areas.

#### Learning Outcomes

It is expected that your student will

- be able to identify plant and animal wastes, and describe how they are recycled in nature

For example, plant leaves serve as a source of food for soil insects, worms, and other creatures. The wastes of these animals may then be further broken down by moulds, fungi, and bacteria.

## Additional Required Materials

### Activity 1: Decomposing Dinner

- 2 slices of tomato
- 2 pieces of lettuce
- 2 slices of carrot (about 1 cm thick)
- 2 plant pots
- a tray (pie plate or baking pan)
- garden soil (not potting soil)
- a spoon
- water

## Lesson 2: Human-Made Waste

### Summary

In this lesson, your student will begin to examine air, land, and water pollution that is created by people. He or she will see how waste can pollute the land. He or she will discover how rainwater can wash waste from landfills and ditches into rivers and lakes. In Activity 2, your student will try to collect evidence of air pollution. If your student lives in a city, he or she simply needs to place a jar with water outside to catch some air pollution. If your student lives in a rural area, the jars may need to be placed more strategically, such as in a garage or near animals or burn piles. If your student has access to a magnifying glass or microscope, he or she might enjoy looking more closely at the air pollution that collects on the coffee filters.

### Learning Outcomes

It is expected that your student will

- be able to identify and classify wastes that result from human activity

## Additional Required Materials

### Activity 2: Air Fare

- 4 similar jars
- 4 coffee filters
- a funnel
- a magnifying glass (optional)
- water
- masking tape
- a felt marker



## Lesson 3: Water Waste

### Summary

In this lesson, your student will study water pollution. He or she will see how homes and buildings generate grey water and sewage. Your student will be introduced to sewer systems. If possible, take a walk with your student to point out utility covers, drainage ditches, pumping stations, and other signs of your community's sewer system. If the student lives in a rural area, point out the well, septic system, and any other related areas.

Your student should realize that in Canada, we have with plenty of fresh water, but we still have water problems. Many communities experience water shortages, and occasionally fresh water, including drinking water, can become contaminated. Water is a precious resource that cannot be replaced.

In Activity 3, your student will compare the amount of water used in a bath versus that used in a shower. For an extra step, you may want to suggest that your student turn off the water periodically while he or she takes a shower, such as when soaping up, to see how little water is actually needed to get clean.

### Learning Outcomes

It is expected that your student will

- be able to identify and classify wastes that result from human activity

### Additional Required Materials

#### Activity 3: Bath or Shower?

- a bathtub with a shower
- a ruler

## Lesson 4: Pollution on Land

### Summary

In this lesson, your student will study land pollution. Your student will examine the problem of garbage and the amount that ends up in landfills. He or she will also discover how many types of waste, including everyday items such as household cleaners, are poisonous or toxic.

The feature "A Closer Look" describes middens (garbage disposal sites of West Coast First Nation villages). Since all of the materials these people used were organic, these piles decomposed. You may want to ask your student to consider how the amount of waste produced by people today would differ from the amount of waste produced by people living in his or her community 100 years ago.

A second "A Closer Look" discusses toxic waste treatment at the Swan Hills Treatment Centre.

In Activity 4, your student will investigate which waste materials are biodegradable. This activity takes several days to complete, so you may want to remind your student to check his or her activity every second day. Ensure that your student uses garden soil rather than sterilized potting soil because potting soil will not have the bacteria necessary for good decomposition.

## Learning Outcomes

It is expected that your student will be able to

- identify and classify wastes that result from human activity
- distinguish between wastes that are readily biodegradable and those that are not
- identify kinds of wastes that may be toxic to people and to the environment

## Additional Required Materials

### Activity 4: Biodegradable Bits

- a clear plastic cup or other clear, wide-mouthed container
- garden soil (not potting soil)
- waste scraps: small pieces of paper, cardboard, aluminum foil, plastic, and a few vegetable or fruit scraps
- plastic wrap



## ASSIGNMENT BOOKLET 5A

Science 4  
Module 5: Section 1 Assignment

### Home Instructor's Comments and Questions

\_\_\_\_\_  
**Home Instructor's Signature**

### FOR HOME INSTRUCTOR USE (if label is missing or incorrect)

Student File Number:

\_\_\_\_\_

Date Submitted:

\_\_\_\_\_

**Apply Module Label Here**

**Name**

**Address**

**Postal Code**

*Please verify that preprinted label is for  
correct course and module.*

### FOR SCHOOL USE ONLY

Assigned Teacher:

\_\_\_\_\_

Date Assignment Received:

\_\_\_\_\_

Grading:

\_\_\_\_\_

Additional Information:

\_\_\_\_\_

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### Teacher's Comments

\_\_\_\_\_  
**Teacher's Signature**

**Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.**

## INSTRUCTIONS FOR SUBMITTING THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you are registered for distance learning courses, you are expected to regularly submit completed assignments for correction. Try to submit each Assignment Booklet as soon as you complete it. Do not submit more than one Assignment Booklet in one subject at the same time. Before submitting your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

### MAILING

1. Do **not** enclose letters with your Assignment Booklets. **Send all letters in a separate envelope.**
2. Put your Assignment Booklet in an envelope and take it to the post office and have it weighed. Attach **sufficient postage** and seal the envelope.

### FAXING

1. Assignment Booklets may be faxed to the school with which you are registered. Contact your teacher for the appropriate fax number.
2. All faxing costs are the responsibility of the sender.

### E-MAILING

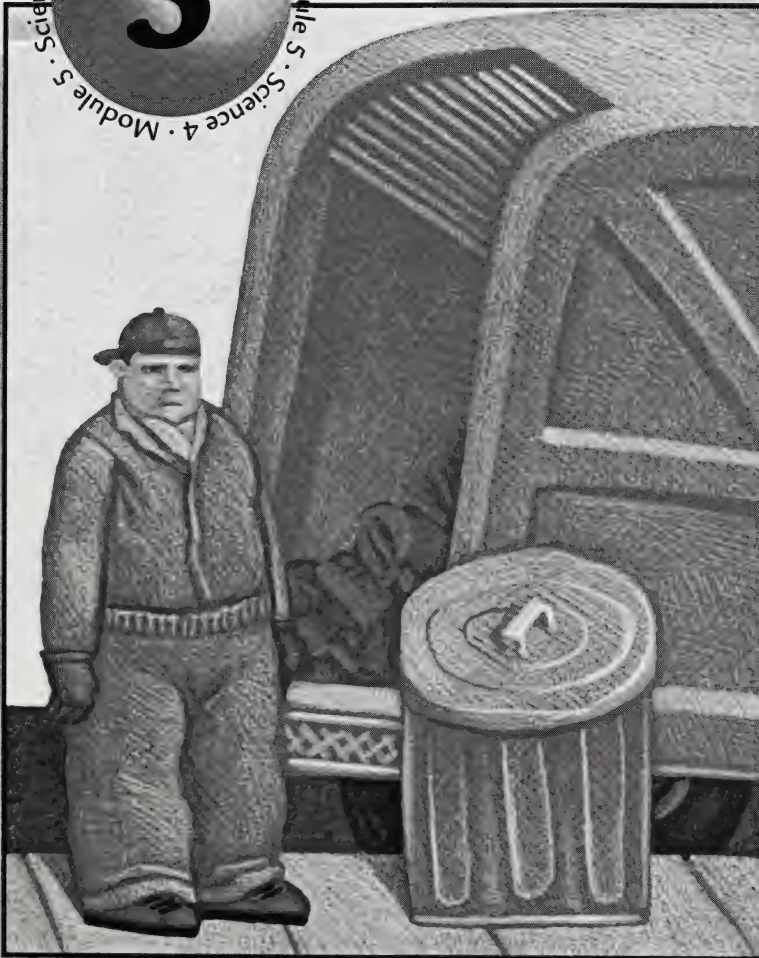
It may be possible to e-mail your completed Assignment Booklet to the school with which you are registered. You also may be **required** to e-mail some of your assignments. Contact your teacher for the appropriate e-mail address.



# Science 4

## Waste and Our World Assignment Booklet 5A

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**5**  
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## FOR TEACHER'S USE ONLY

### Summary

	Total Possible Marks	Your Mark
Lesson 1 Assignment	5	
Lesson 2 Assignment	9	
Lesson 3 Assignment	15	
Lesson 4 Assignment	6	
	35	

### Teacher's Comments

Science 4  
Module 5: Waste and Our World  
Assignment Booklet 5A  
Learning Technologies Branch

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- Learning Resources Centre, <http://www.lrc.education.gov.ab.ca>

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## ASSIGNMENT BOOKLET 5A

### SCIENCE 4: MODULE 5

### SECTION 1 ASSIGNMENT

This Assignment Booklet is worth 35 marks out of the total 112 marks for the assignments in Module 5. The value of each assignment and each question is stated in the left margin.

Read all parts of your assignment carefully and record your answers in the appropriate places. If you have difficulty with an assignment, go back to your Student Module Booklet and review the appropriate lesson. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

**Note:** If you are using electronic assignments, you will need to do the following:

- You need to print the pages that ask you to make a drawing. You will find them in your PDF file.
- You will need to mail your drawings to your teacher.

35

5

### Section 1 Assignment: Natural and Human-Made Waste

1. Why don't you see material from dead plants and animals piled up all around you? Use complete sentences to explain your answer.

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Your teacher will look for

- use of new words from Lesson 1 (2 marks)
- how you explain the breakdown of plant and animal wastes (2 marks)
- complete sentences (1 mark)



When you are ready, turn to Lesson 2 in your Student Module Booklet.

6

2. a. List two examples for each type of pollution.

air pollution

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water pollution

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land pollution

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Your teacher will look for

- two correct examples for each type of pollution (1 mark each)



- 3 b. How does air pollution from cars and factories end up in lakes, rivers, and forests? Answer in complete sentences.

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Your teacher will look for

- your explanation of how air pollution from cars and factories ends up in lakes, rivers, and forests (2 marks)
- complete sentences (1 mark)



When you are ready, turn to Lesson 3 in your Student Module Booklet.

- 15 3. Make a Personal Action Plan to Reduce Water Usage. List five ideas for ways to save water in your home (idea) and record how you will make that happen (action). The chart is on the following page.

Your teacher will look for

- five practical ideas (1 mark each)
- five actions that will make your ideas work (2 marks each)

**Note:** You will need your Personal Action Plan for question 10 in Assignment Booklet 5B. Keep it handy when your teacher returns it.

**Personal Action Plan to Reduce Water Usage**

Idea	Action





When you are ready, turn to Lesson 4 in your Student Module Booklet.

③

4. a. What does “biodegradable” mean? Give two examples of biodegradable waste.

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Your teacher will look for

- a good explanation of “biodegradable” (1 mark)
- two examples of biodegradable materials (1 mark)
- complete sentences (1 mark)

③

- b. List three types of garbage that are **NOT** biodegradable.

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Your teacher will look for

- three examples of non-biodegradable materials (1 mark each)



Now return to your Student Module Booklet and read the Section 1 Conclusion and the Optional Follow-up Activities.





## Home Instructor Feedback Form

### Module 5: Section 1

Answer the following questions and mail them in with the completed assignment for this section.

1. Was your student able to find examples of waste in his or her home environment? What types of waste were found?

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2. Did your student have any difficulty with the vocabulary in this section? Explain.

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Please add any questions or comments you may have.

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## Student Feedback Form

### Module 5: Section 1

Answer the following questions and mail them in with the completed assignment for this section. This is not a test, and there are no marks assigned.

1. What type of waste in your environment was most surprising to you? Explain.

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2. Were you able to use the Internet sites suggested for this section? If so, were they useful?

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## Checklist for Module 5: Assignment Booklet 5A

Make sure you send in all of the following items.

- ☐ Assignment Record Form
- ☐ Assignment Booklet 5A, questions 1–4
- ☐ Home Instructor Feedback Form
- ☐ Student Feedback Form
- ☐ Optional Follow-up Activity (optional)

Are you sending some work by e-mail and other work through the mail?  
If so, send a note to your teacher. That way your marks will not be given  
until all work has been received.

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